

**Talking Points**  
**American University, Washington, DC**  
**October 17, 1994**

- The world has changed. Competition with the Soviet Union drove the U. S.. space program for 30+ years
  - Russians launched Gagarin to show superiority
  - U. S.. did Apollo to make bold statement about our willingness to spend whatever money needed to launch big payloads. Took 4.5% of budget at peak. (Today ~1%)
  - Even extended to planetary exploration
- Soviet Union collapsed at speed of light.
  - SS-18 factory vignette.
- Congress questioned why we need to spend money on space now that competition is gone.
  - Also a perception of waste and mismanagement by the "troubled space agency." (We had only a few real failures, but America's national mood needed to blame someone.)
- Couple that perception with outside drivers:
  - Weak economy
  - National debt (spending spree by my generation). Today interest = \$250 billion
  - Entitlements (today = \$750 billion)
  - Mood to downsize government (Mini Mott at White house vignette?)
  - Changing mix in Congress (new faces less committed to NASA)

- Result was big trouble for NASA. Wake-up call came with 1993 station vote.
  - More than just the station. The entire space program was at stake. Earlier this year, we faced cut to \$7 billion.
- NASA faced a choice. Follow the traditional course and risk cancellation of the program or choose a path of change.
  - Learn to live with flat/declining budget
  - Better balance between science/human flight
  - Only way to pay for new starts is to cut other costs.
- By cleaning up our act, we now have best level of support in years:
  - Station passed by 2-1 in House/Senate this year.
  - Firm backing and proactive efforts by President & VP. (Apollo 11 Oval Office vignette?)
  - American public is changing perception of NASA because we're delivering on our promises.
- Dealing with change is a plus, not a minus. Result is a stronger program. No longer will allow mediocrity and status quo.
- Ten years from now NASA will look very different. Much less \$\$\$ spent on operational issues and institutional issues. We want to reverse the percentages we're spending on operations vs. bold, new endeavors.

- Continue technology investment and build more X-vehicles
  - Goal is to be able to launch a spacecraft a month.
  - Access to space is our highest priority
  - New types of spacecraft a close second

## **GUIDING PRINCIPLES**

- Relevance
  - Program must pass relevance tests to survive.
  - Benefit to America? Inspires young people? New level of knowledge? Technologies to spur new industries? Does it involve America?

### **Cooperation, not just competition**

- Makes sense from fiscal, political points of view.
- No reason for countries to duplicate efforts. Major players spend ~\$29 billion/year on civil space. Many duplicate capabilities of launch vehicles, satellites.
- Programs can still maintain expression of national purposes.

- Revolution, not evolution
  - New approaches will open up solar system as never before—with affordable costs.
  - Technology may apply to non-aerospace industries (but can't be used to justify whole program)

- Less is more
  - Same or better capabilities at less cost (e.g., new Mars missions @ 1/20 Viking cost).
  - Drive to "live off the land" in planetary exploration.
- Diversity in people, places and ideas
  - NASA inspires whole nation, so we must look like America
  - Personally committed to diversity within NASA. Also making it a criterion for contract awards.
  - Involve people where "NASA is not." Need input from more than just Texas, Florida, California, Alabama. Open our minds to new ideas and not lock them out because they're not part of the old boys' network.
- Outreach
  - NASA hasn't done good job of communicating—one reason I'm here tonight.
  - Make sure that communication is everybody's job at NASA.

## **THE VISION**

- A new "golden age" of space exploration is coming. Open up space frontier to more than a select few. New info about Planet earth. Most incredible exploration of solar system ever.
  - Moon rock wall at Houston vignette.
- New launch vehicle will be key. Likely that some people in this room will be able to fly in not-too-distant future

- Between now and 2010, launch small armada of probes. Marvels of microelectronics and micromechanics.
  - Planets, asteroids, comets.
  - Includes flybys, orbiters, sample returns
- Use space station to see how well humans can live and work effectively in space for long periods.
  - Technical testbed for spacefaring technologies, e.g., telemedicine, life-support, medical issues.
  - Cultural testbed for cooperation between nations. Largest international technology project ever.
- Must see astronauts as explorers, not national treasures. Space is a risky place, but can't let fear paralyze us.
- Learn to do any mission in 8 years, not 30 years. Cost in tens of billions, not half-trillion.

## **THE ULTIMATE GOAL**

- When all the conditions are satisfied, what then? We have options. We have time to decide. Here is my vision of several possible scenarios.
- Return to the Moon.
  - May not drive us to create new spacefaring technologies. Also a question of public support; as young people say, "Been there, done that."

- Space station on near-Earth asteroids.
  - Especially attractive if precursor missions find water to be converted into rocket fuel, breathing air.
- Deimos/Phobos
  - Martian moons may have water, carbon compounds for resources.
  - Could supply survey teams on parts of Mars where it's impractical to extract water from atmosphere or process from soil. (Not sure if there's subsurface water.)
- Mars
  - Almost certain destination eventually.
  - Early expeditions would prove concepts for using resources.
  - Ultimately, explorers would live off the land, conduct large-scale exploration with humans and robots.
- All our missions will help answer larger questions. Things we'll learn:
  - The boundaries of our solar neighborhood.
  - How we might use comets and asteroids for economic benefit. Are they a threat, *a la* Shoemaker-Levy?
  - What constitutes "life," and how we might recognize it on other worlds.
  - Impact of discovery of life elsewhere. What if we could image a life-bearing planet? Effects on everything from art to religion to engineering.